Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of the Claims:

In the Claims:

1. (Currently Amended) A method comprising:

selecting an original training sequence from a set of possible original training sequences having at ~~least~~ one or more desired ~~property~~ properties, the original training sequence comprising a sequence of complex numbers corresponding to phase shifts employed by a π/M – MPSK modulation format; and

forming a modified training sequence by ~~modifying the original training sequence based on a corresponding modifying sequence~~ multiplying each element of the original training sequence by a corresponding element of a modifying sequence, the modifying sequence comprising a sequence of pairs of equal complex numbers, wherein each pair of equal complex numbers comprises the previous pair of complex numbers multiplied by $\exp(j2\pi/M)$;

~~such that~~ wherein the modified training sequence exhibits the ~~one~~ one or more desired ~~property~~ properties of the original training sequence when used in a peak to average power constrained modulation format that would otherwise impair the one or more desired ~~property~~ properties of the original training sequence.

2. (Currently Amended) The method of claim 1, further comprising appending a prefix and a suffix to the original training sequence prior to forming ~~a~~ the modified training sequence.

3. (Currently Amended) The method of claim 1, wherein the selecting ~~an~~ of the original training sequence comprises cyclically shifting the original training sequence by some integer.

4. (Currently Amended) The method of claim 1, wherein the one or more desired ~~property~~ properties ~~comprises~~ comprise a function of the autocorrelation of any original training sequence in the set of possible original training sequences being below a threshold value.

5. (Currently Amended) The method of claim 1, wherein the one or more desired ~~property~~ properties ~~comprises~~ comprise a function of the cross-correlation of any original training sequence in the set of possible original training sequences with any other original training sequence in the set of possible original training sequences being below a threshold value.

6. – 9. (Cancelled)

10. (Currently Amended) The method of claim ~~9~~ 1, wherein the modulation format is a $\pi/2$ – 2PSK modulation format.

11. (Original) The method of claim 10, wherein the modifying sequence comprises the sequence (1,1,-1,-1) repeating.

12. (Currently Amended) The method of claim ~~6~~ 1, wherein selecting ~~an~~ the original training sequence comprises selecting a Gold sequence from a family of Gold sequences.

13. – 45. (Cancelled)

46. (Previously Presented) The method of claim 1, wherein the modified training sequence is applied to at least one of a TDMA, a FDMA, a CDMA and a FDD radio communications system.

47. (Canceled)

48. (Canceled)

49. (New) A method comprising:

selecting an original training sequence from a set of possible original training sequences having at one or more desired properties, the original training sequence comprising a sequence of phase shifts to be performed on a waveform as employed by a π/M – MPSK modulation format; and

forming a modified training sequence by multiplying each element of the original training sequence by a corresponding element of a modifying sequence, the modifying sequence comprising a sequence of

pairs of equal phase shifts, wherein each pair of equal phase shifts is larger in magnitude by $2\pi/M$ radians than the previous pair of equal phase shifts;

wherein the modified training sequence exhibits the one or more desired properties of the original training sequence when used in a peak to average power constrained modulation format that would otherwise impair the one or more desired properties of the original training sequence.

50. (New) The method of claim 49, wherein the modulation format is a $\pi/2$ – 2PSK modulation format.

51. (New) The method of claim 50, wherein the modifying sequence comprises the sequence $(0,0, \pi, \pi)$ radians repeating.

52. (New) A method comprising:

transmitting a modified training sequence derived by selecting an original training sequence from a set of possible original training sequences having at one or more desired properties, the original training sequence comprising a sequence of phase shifts to be performed on a

waveform as employed by a π/M – MPSK modulation format, and multiplying each element of the original training sequence by a corresponding element of a modifying sequence, the modifying sequence comprising a sequence of pairs of equal phase shifts, wherein each pair of equal phase shifts is larger in magnitude by $2\pi/M$ radians than the previous pair of equal phase shifts.

53. (New) An base station comprising:

a data storage element to store a modified training sequence derived by selecting an original training sequence from a set of possible original training sequences having at one or more desired properties, the original training sequence comprising a sequence of phase shifts to be performed on a waveform as employed by a π/M – MPSK modulation format, and multiplying each element of the original training sequence by a corresponding element of a modifying sequence, the modifying sequence comprising a sequence of pairs of equal phase shifts, wherein each pair of equal phase shifts is larger in magnitude by $2\pi/M$ radians than the previous pair of equal phase shifts;

a receiver to receive a communication waveform; and

a processor to train the apparatus using the received communication waveform and the stored modified training sequence.

54. (New) The base station of claim 53, wherein the original training sequence is selected by cyclically shifting the original training sequence by some integer.

55. (New) The base station of claim 53, wherein the one or more desired properties comprise a function of the autocorrelation of any original training sequence in the set of possible original training sequences being below a threshold value.

56. (New) The base station of claim 53, wherein the one or more desired properties comprise a function of the cross-correlation of any original training sequence in the set of possible original training sequences with any other original training sequence in the set of possible original training sequences being below a threshold value.

57. (New) A machine-readable medium having stored thereon data representing instructions that, when executed by a processor, cause the processor to perform operations comprising:

selecting an original training sequence from a set of possible original training sequences having at one or more desired properties, the original training sequence comprising a sequence of complex numbers corresponding to phase shifts employed by a π/M – MPSK modulation format; and

forming a modified training sequence by multiplying each element of the original training sequence by a corresponding element of a modifying sequence, the modifying sequence comprising a sequence of pairs of equal complex numbers, wherein each pair of equal complex numbers comprises the previous pair of complex numbers multiplied by $\exp(j2\pi/M)$;

wherein the modified training sequence exhibits the one or more desired properties of the original training sequence when used in a peak to average power constrained modulation format that would otherwise impair the one or more desired properties of the original training sequence.

58. (New) The machine-readable medium of claim 57, further comprising appending a prefix and a suffix to the original training sequence prior to forming the modified training sequence.

59. (New) The machine-readable medium of claim 57, wherein the selecting of the original training sequence comprises cyclically shifting the original training sequence by some integer.

60. (New) The machine-readable medium of claim 57, wherein the one or more desired properties comprise a function of the autocorrelation of any original training sequence in the set of possible original training sequences being below a threshold value.

61. (New) The machine-readable medium of claim 57, wherein the one or more desired properties comprise a function of the cross-correlation of any original training sequence in the set of possible original training sequences with any other original training sequence in the set of possible original training sequences being below a threshold value.

62. (New) The machine-readable medium of claim 57, wherein the modified training sequence is applied to at least one of a TDMA, a FDMA, a CDMA and a FDD radio communications system.